T02THO" 85685260

FIGURE 1

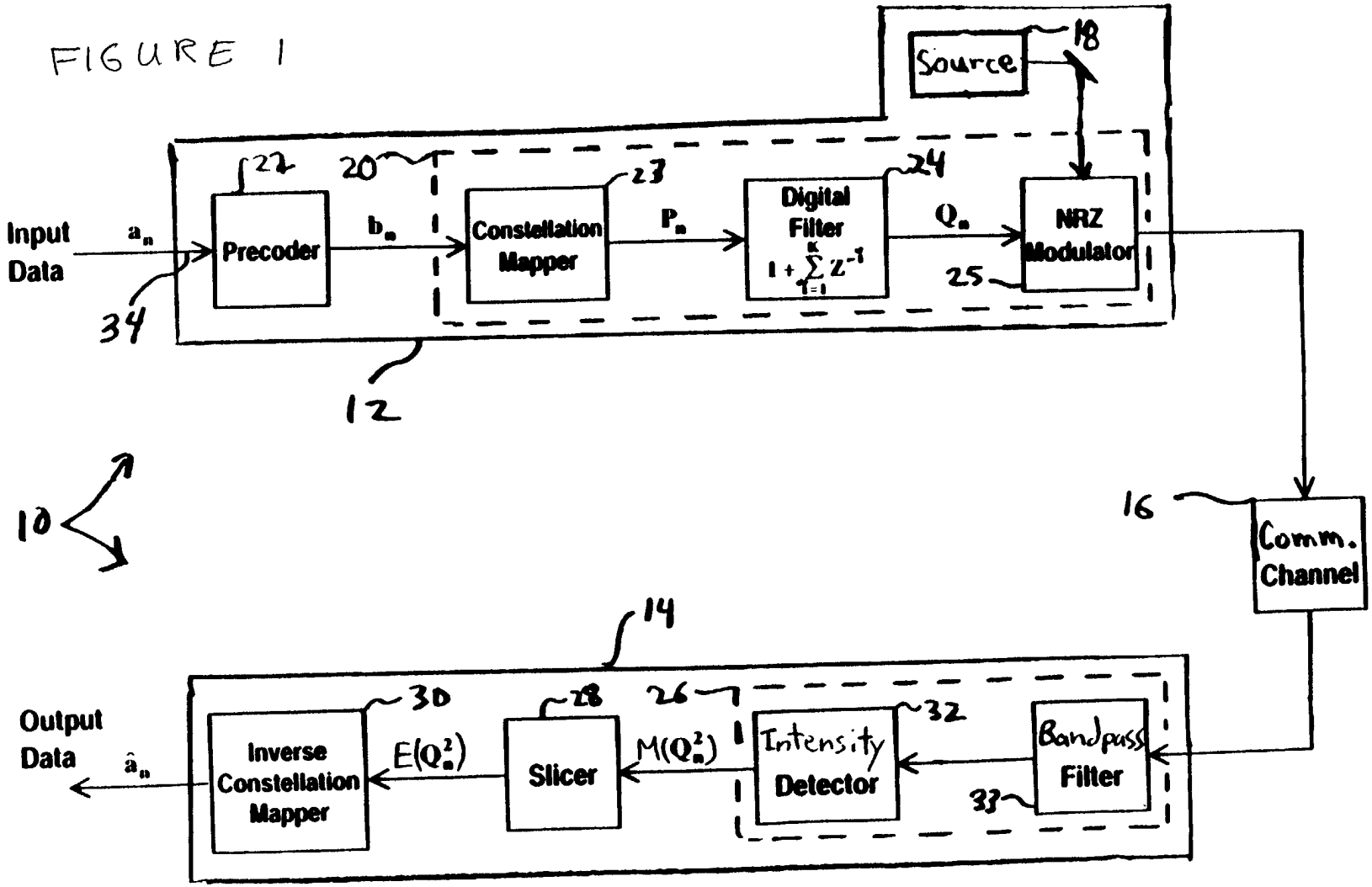

FIGURE 2

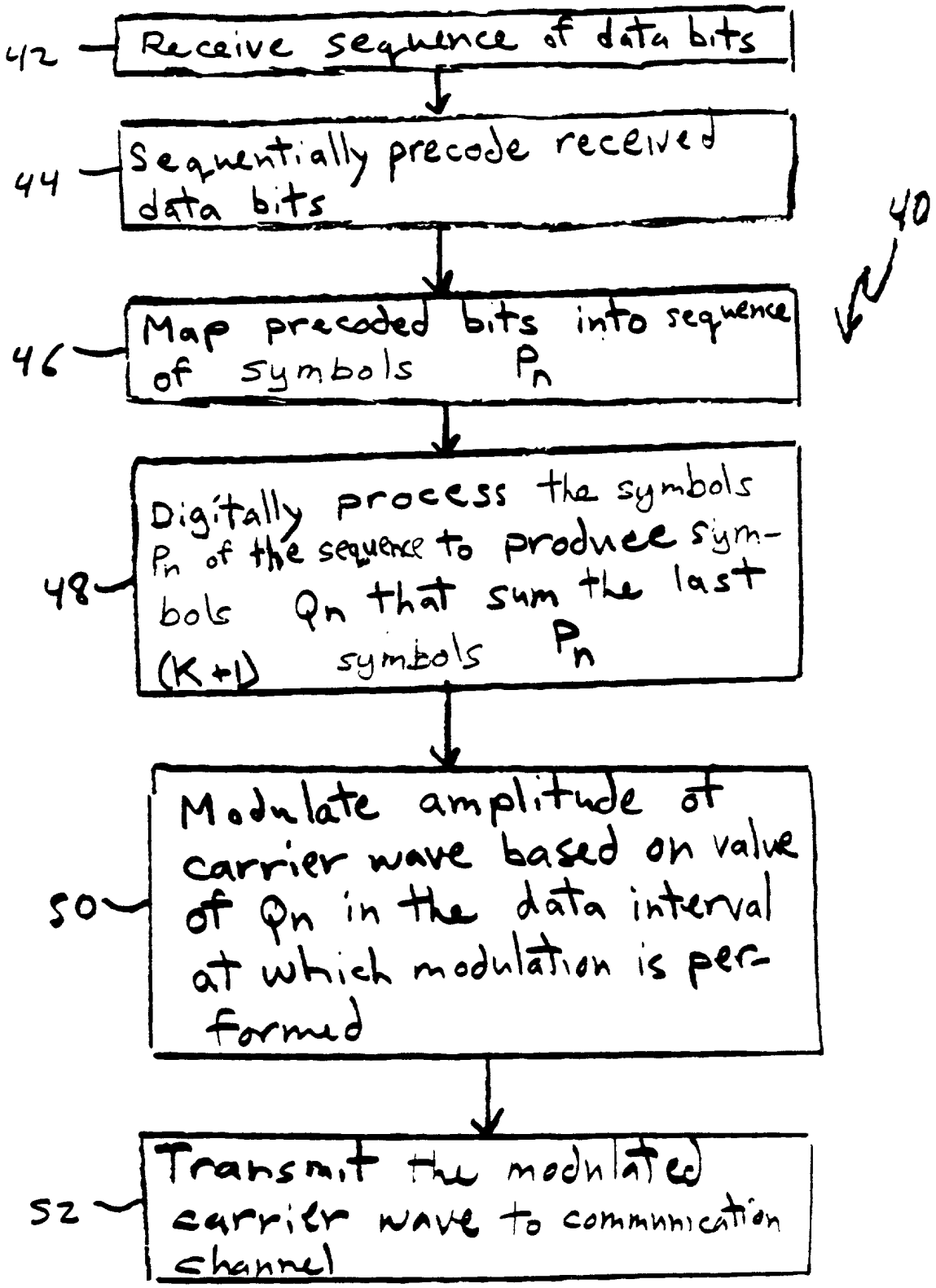

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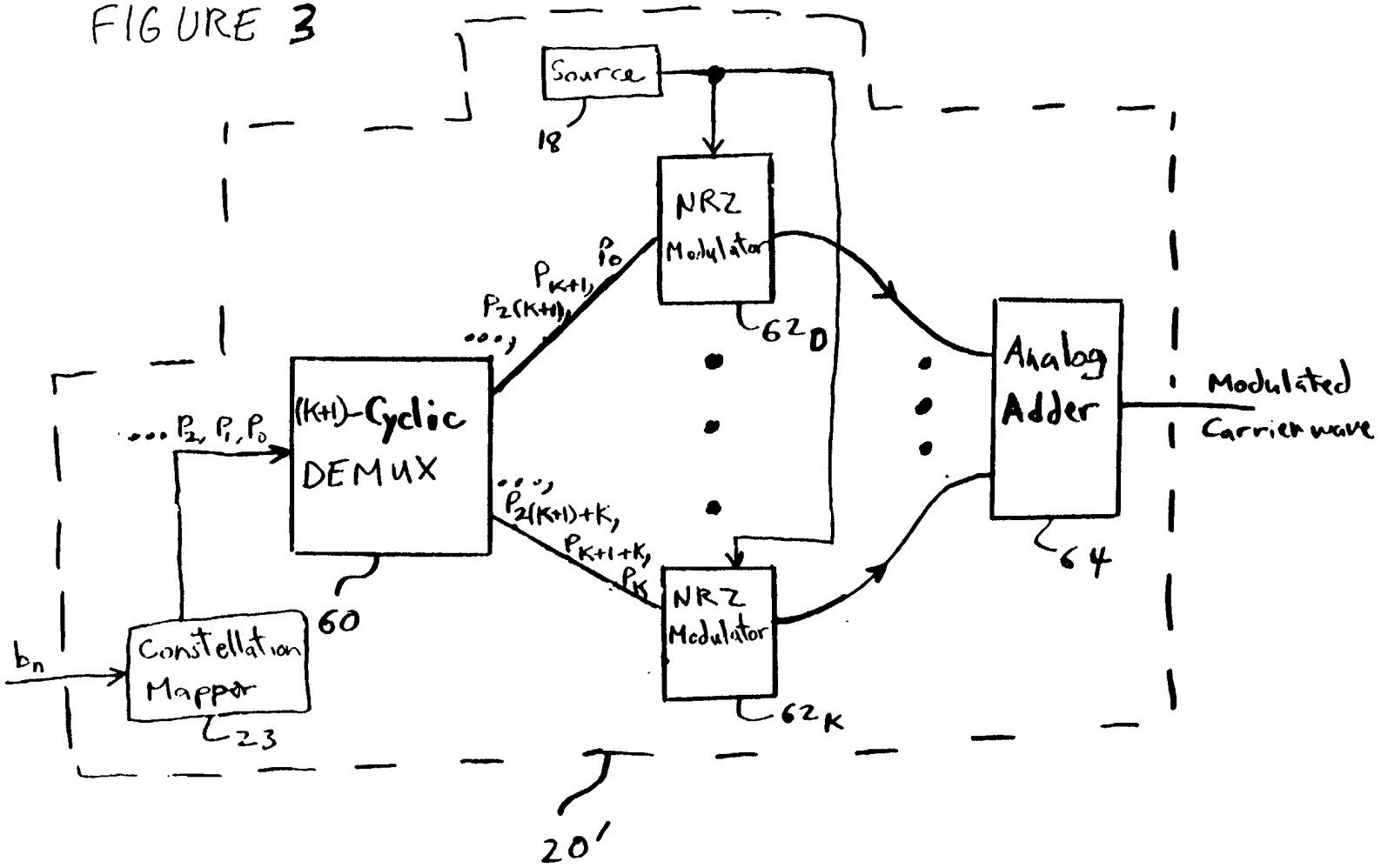
FIGURE 3



Wei-52

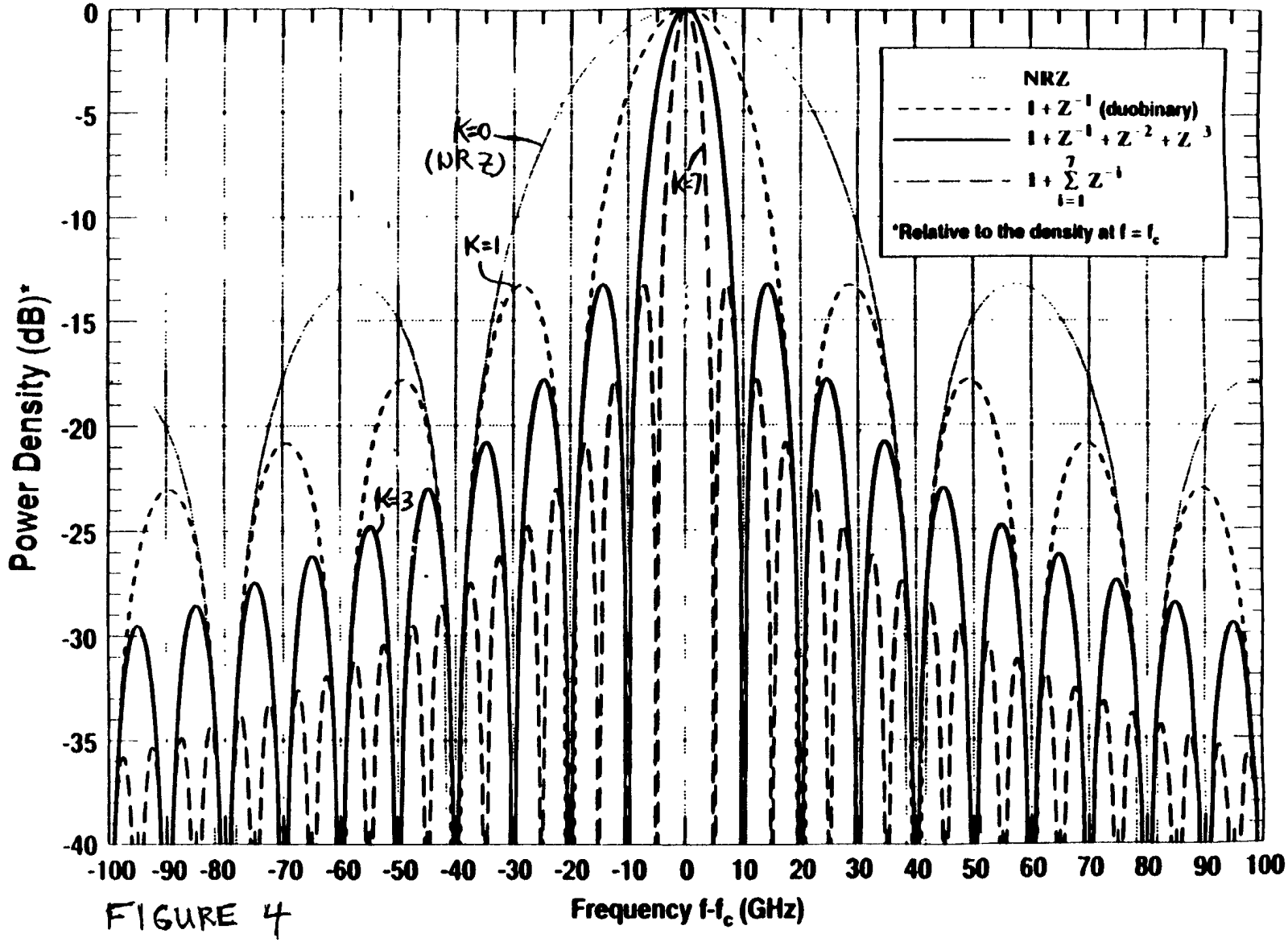

NRZ
1 + Z⁻¹ (duobinary)
1 + Z⁻¹ + Z⁻² + Z⁻³
1 + Σ Z⁻ⁱ (i=1 to 7)
*Relative to the density at f = fc
K=0 (NRZ)
K=1
K=3
K=7
Power Density (dB)*
Frequency f-fc (GHz)
0
-5
-10
-15
-20
-25
-30
-35
-40
-100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100

FIGURE 4

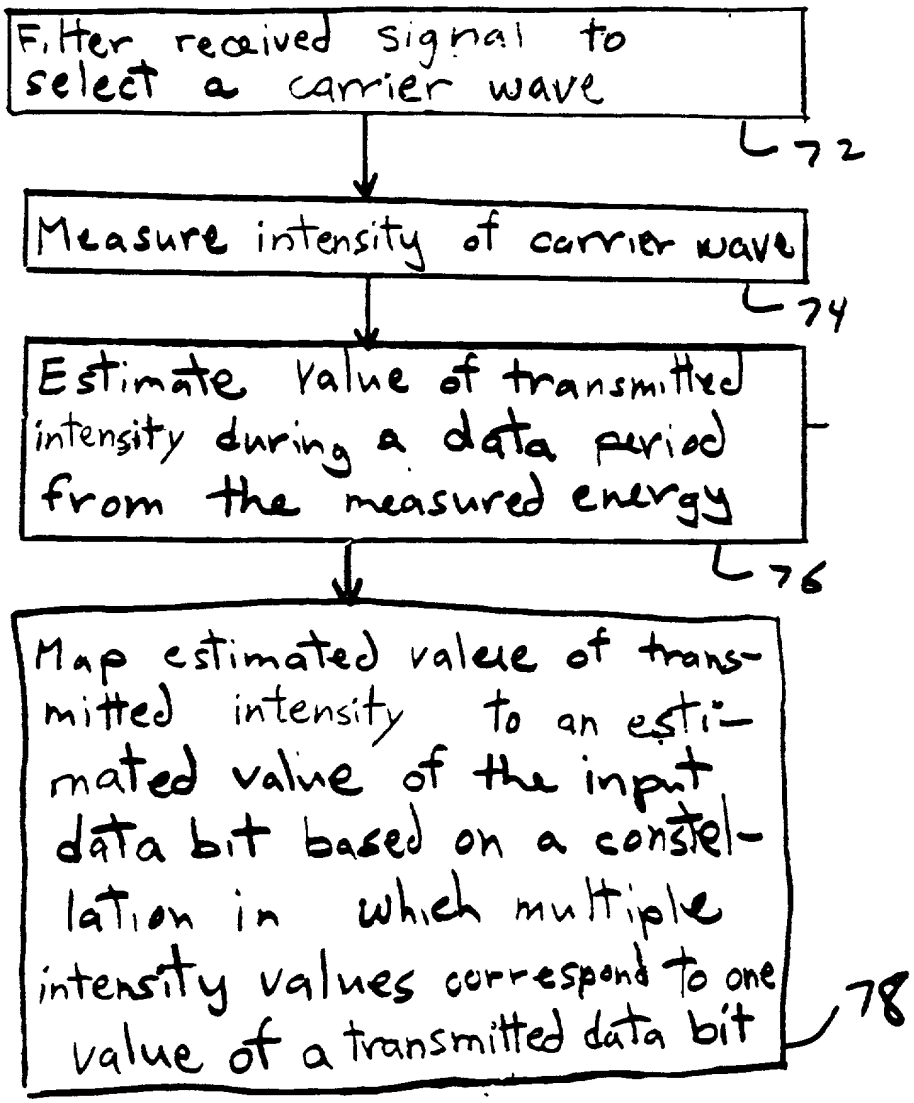

Filter received signal to select a carrier wave
72
Measure intensity of carrier wave
74
Estimate value of transmitted intensity during a data period from the measured energy
76
Map estimated value of transmitted intensity to an estimated value of the input data bit based on a constellation in which multiple intensity values correspond to one value of a transmitted data bit
78
70

Figure 5

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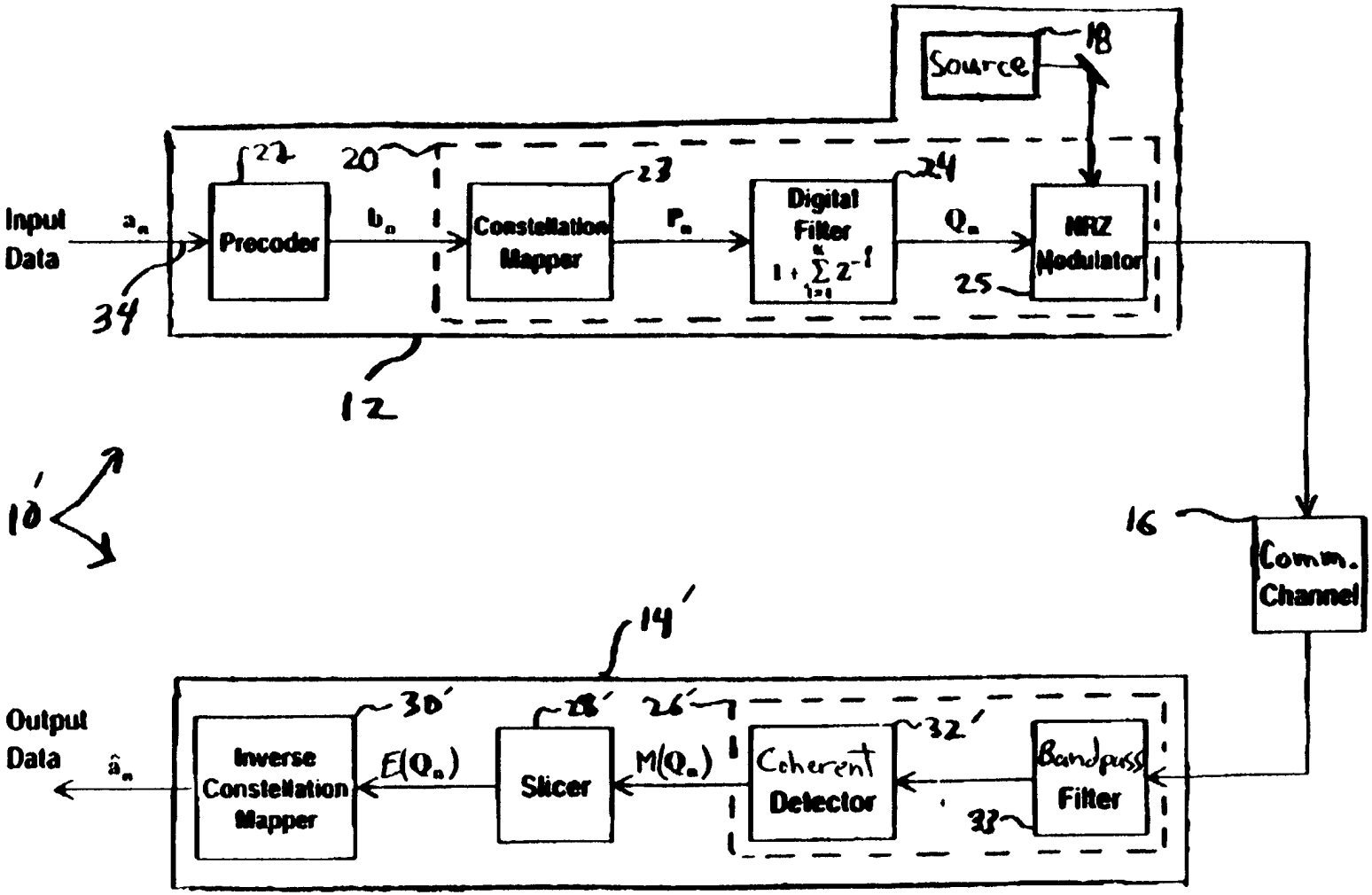

Figure 6

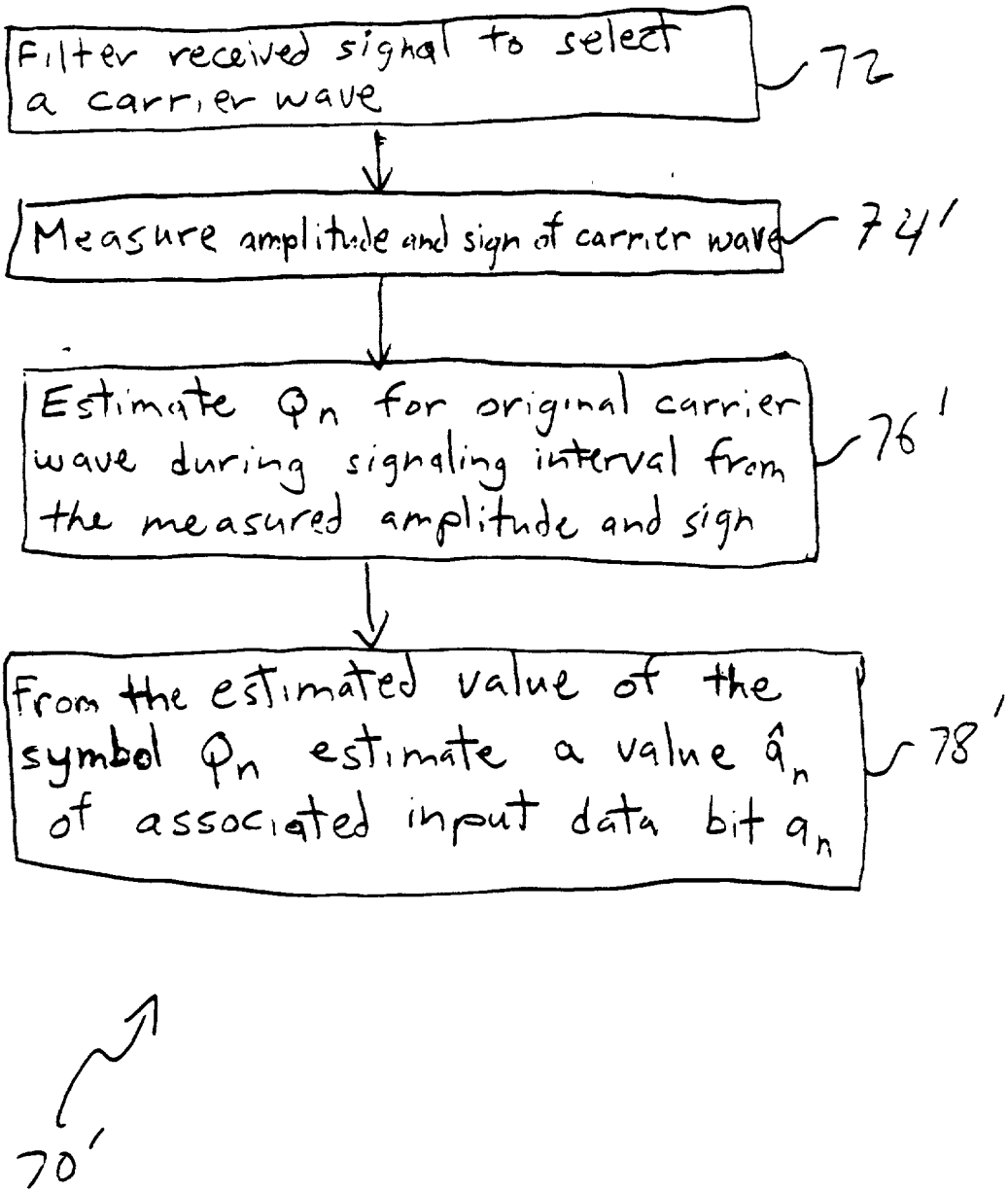
Filter received signal to select a carrier wave
72
Measure amplitude and sign of carrier wave
74'
Estimate φ_n for original carrier wave during signaling interval from the measured amplitude and sign
76'
From the estimated value of the symbol φ_n estimate a value $\hat{a}_n$ of associated input data bit a_n
78'
70'

FIG. 7

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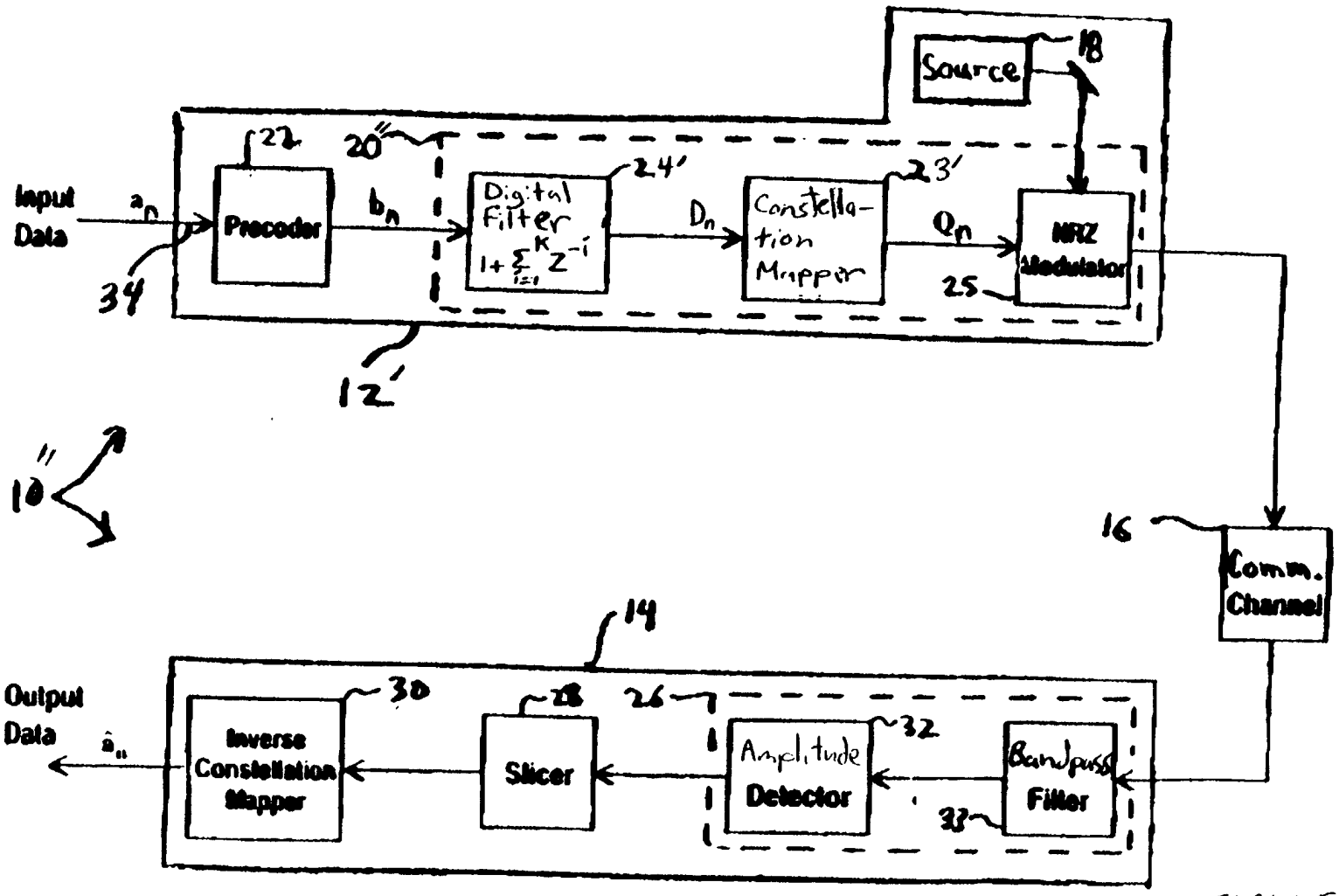

FIGURE 8

Digital Filter	Normalized Signal Bandwidth*	Loss in Receiver Sensitivity (dB)*	Number of Transmitter Signal Amplitudes Q_n	Number of Receiver Signal Amplitudes Q_n^2
$1 + Z^{-1}$ (duobinary)	$\frac{1}{2}$	0	3	2
$1 + Z^{-1} + Z^{-2} + Z^{-3}$	$\frac{1}{4}$	3	5	3
$1 + \sum_{i=1}^{5} Z^{-i}$	$\frac{1}{6}$	4.8	7	4
$1 + \sum_{i=1}^{7} Z^{-i}$	$\frac{1}{8}$	6	9	5
⋮	⋮	⋮	⋮	⋮
$1 + \sum_{i=1}^{15} Z^{-i}$	$\frac{1}{16}$	9	17	9

*Relative to a baseline on/off NRZ modulation.

FIGURE 9